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ABSTRACT

The plan described was developed to evaluate the training and cost-effectiveness of the Automated Instructional Management System (AIMS), a computer-based training and resource development system being developed by the Training and Doctrine Command (TRADOC) for possible installation in its schools and training centers. The Functional Description of the proposed AIMS was examined to identify the hardware and software packages intended for development. Stufflebeam's CIPP Model (Context, Input, Process, Product) served as the theoretical framework for the evaluation. Evaluation questions were formulated to guide the examination of the AIMS hardware/software, training management, courseware, training effectiveness, cost, and implementation/organization factors. A Milestone Chart was prepared to indicate deadlines for the evaluation activities, and a description of the staff required to implement the evaluation plan was prepared. Draft data collection instruments were devised with the caveat that revisions would be required to tailor them to the specific software packages operational at each AIMS site. A reduced version of this plan has been prepared to evaluate the AIMS test site at the U.S. Army Field Artillery School, Ft. Sill, Oklahoma. Six references are listed, and copies of the data collection instruments are attached. (Author/LLS)

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Research Report 1279

A FORMATIVE EVALUATION PLAN FOR THE AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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FOREWORD

The Computer-Based Instructional Systems team of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) performs research and development in the area of educational technology with applicability to military education and training. Of special interest is research in the area of large scale computer-based instructional systems. The development and implementation of these systems is seen as a solution to current Army training problems such as the management of self-paced instruction.

This Research Report reviews the proposed functions of one such system -- the Automated Instructional Management System (AIMS) -- and provides a formative evaluation plan to assess its management, training, and cost effectiveness. The research effort is responsive to the requirements of RDT&E Project 2Q263744A795, Manpower and Educational Systems Technical Area of the FY 80 ARI Work Program.

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A FORMATIVE EVALUATION PLAN FOR THE AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

BRIEF

Requirement:

To develop a plan to evaluate the training and cost-effectiveness of the Automated Instructional Management System (AIMS). The AIMS is a computer-based training and resource development system being developed by the Training and Doctrine Command (TRADOC) for possible installation at its schools and training centers.

Procedure:

The Functional Description of the proposed AIMS was examined to identify the hardware and software packages intended for development. Stufflebeam's CIPP Model (Context, Input, Process, Product) served as the theoretical framework for the evaluation. Evaluation Questions were formulated to guide the examination of the AIMS hardware/software, training management, courseware, training effectiveness, cost, and implementation/organizational factors. A Milestone Chart was prepared to indicate deadlines for the evaluation activities from the development of data collection instruments through preparation of the final report. A description of the staff required to implement the evaluation plan was prepared. Draft data collection instruments were devised with the guidance that revisions would be required to tailor the instruments to the specific software packages operational at each AIMS site.

Utilization of Findings:

A reduced version of this plan has been prepared to evaluate the AIMS test site at the US Army Field Artillery School, Ft. Sill, OK. The formative evaluation at Ft. Sill will provide data for system revisions which may be implemented prior to the AIMS installation at the remaining TRADOC sites. The present plan provides for analyses pre- and post- AIMS installation with the intention of providing information for the design of the next generation of computer-based instructional systems.

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A FORMATIVE EVALUATION PLAN FOR THE AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

BACKGROUND

The Army has made a substantial commitment to self-paced instruction which enables the student to progress at his/her own rate. However, if the student must wait for equipment, assignments, tests, instructor aid, and even other students, the benefits of progressing through a course at an individual pace are lost. For this reason, computers have had an increasing role in the modern training institution. Computer-managed instructional systems provide the necessary data processing associated with self-paced instruction so that timely information can be made available to instructors and students.

In 1975, the headquarters of the U.S. Army Training and Doctrine Command (TRADOC) directed that self-paced training be implemented throughout its schools. At one TRADOC school, the U.S. Army Field Artillery School (USAFAS), Ft. Sill, Oklahoma, the impact of this mandate affected eight courses training 6 - 8,000 students annually. A complex and burdensome manual process for administering these courses emerged. Instructors who were trained to develop, review and deliver instruction, were required to spend most of their time performing clerical tasks such as marking check-sheets to indicate student progress.

As self-paced courses proliferated, an urgent need was perceived at the USAFAS and throughout TRADOC for a systematic method for managing and administering the new self-paced training. In response to this need, a feasibility study was conducted to determine the most appropriate computer-managed instruction (CMI) system needed to support USAFAS self-paced training. An analysis was made of the Versatile Training System (VTS) developed by the Naval Weapons Center at China Lake, California; the Memphis CMI System developed by the Navy; and the Computerized Training System (CTS) developed by the Army under the ABACUS project. The systems were rated on five criteria:

Note. The authors wish to acknowledge the technical and support assistance of Ms. Judith Paris, International Public Policy Research Corporation.

(1) Training support requirements which include management information, scheduling assistance, computer-managed instruction, aids to authoring/developers, and modest CAI potential;

(2) Optimal hardware configuration;

(3) Maintenance;

(4) Continued personnel support; and

(5) Evolution potential.

The VTS received a higher average weighted rating than the other two systems because of its match with the USAFAS' priorities for training support requirements (Bunderson, 1977).

The VTS was developed by the Navy in 1972 under a competitively procured contract which provided total support for software, hardware, maintenance, and documentation. The VTS consists of a central processing unit (CPU) and associated peripherals, optical readers, and terminals. The types and quantities of hardware and capabilities of software are determined for each site's unique requirements. VTS software supports the development of training programs for specific ratings (MOS), indicates resource configuration and scheduling information, and produces a variety of reports. System support software enables up to 64 simultaneous users to interactively enter, store, and retrieve a large amount of data.

The Navy has made available to TRADOC a VTS equipment configuration, software support for necessary modifications, a site manager, maintenance support, and contractor support. The TRADOC version is termed the Automated Instructional Management System (AIMS). The AIMS is a training management system designed to provide automated data collection, processing, and retrieval for personnel files, diagnostic testing, training schedules, graduation prediction, and a variety of course information.

The AIMS was installed at the USAFAS in October 1978 as the test site for all TRADOC schools. The test system consists of a Digital Equipment Corporation (DEC) PDP-11/70 computer, associated peripherals, additional mass storage in the form of a moving head disk, a magnetic tape drive, a high speed printer, terminals, and optical readers. AIMS applications software consists of modified VTS software and programs newly developed according to the USAFAS' requirements.

The following software packages are proposed for modification and development on the AIMS:

- System Support
- Personnel
- Test and Evaluation
- Computer-Managed Instruction (CMI)
- Resource Configuration and Scheduling
- Report Generation

The System Support Software consists of the DEC's Resource Sharing Timesharing System/Extended (RSTS/E) software. The RSTS/E allows files to be created, updated, and deleted from the user's terminal. A Privacy Act Compliance software package has been developed in conjunction with the RSTS/E for the Ft. Sill test site so that no unauthorized software can be installed or modifications made to existing AIMS software.

Personnel Software is being modified/developed so that data such as name, rank, SSN, MOS, training qualifications, and past assignments can be maintained for each student, staff, and faculty member. The personnel files will be used to create a personnel data base; maintain assignment and training histories; assist in-processing and out-processing functions; provide class registration; and prepare class rosters, completion certificates, diplomas, and training reports.

The Test and Evaluation Software is intended for the creation and maintenance of test items and tests. The software will support the creation of a master test item bank, generate tests from the master file, administer and score on-line tests, produce printed tests for off-line use, score off-line tests by a mark-sense reader, and store prescriptions keyed to each test item to be delivered during on-line testing or by hard copy for off-line testing.

Computer-Managed Instruction (CMI) Software is planned to manage single and multi-path progression through a self-paced course. The progress of each student will be recorded and reported to the instructor so that modifications to a student's specific course components or path can be made. The software will also enable the prediction of module, lesson, and course completion times based on historical data.

Resource Configuration and Scheduling Software is being modified/developed to control the availability of training resources. The software will provide class schedules and enable the assignment of training materials (texts, test equipment, tools, training aids) on a time reserved basis.

Reports Generation Software will be modified/developed to produce the reports and forms to interface with the other AIMS software packages. Instructional and administrative personnel will be aided by the rosters, tests, grade sheets, diplomas, and reports produced by the Reports Generation software.

The previously mentioned hardware and preceeding software packages are planned for implementation as a two-phase effort. During Phase I, selected software packages will be tested at the U.S. Army Field Artillery School, Ft. Sill. Additional software options will be exercised during Phase II. The Management Information Systems Office (MISO) of TRADOC's Army Training Support Center (ATSC) requested that the U.S. Army Research Institute (ARI) prepare a plan to evaluate the AIMS. This evaluation plan covers all software options proposed in the Systems Consultants, Inc., Proposal No. 73-78-024, Development of an Automated Instructional Management System for the U.S. Army (Revised 13 November 1978). The plan is responsive to TRADOC's request and reflects the objective of the ARI Work Unit, "Computer-Managed Instruction" (Project A795, Thrust 4, Task B, Work Unit 2, FY80 Work Program).

The following sections of this Research Report describe the proposed evaluation, its conceptual framework, purpose, procedures, staffing, and reporting requirements.

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EVALUATION MODEL

The theoretical framework guiding the proposed evaluation of AIMS is the CIPP (CONTEXT, INPUT, PROCESS, PRODUCT) evaluation model (Stufflebeam, et al., 1971).

The first component - CONTEXT - refers to the initial assessment of need and underlying rationale for the program. This assessment occurs prior to program initiation and results in statements of system deficiencies and needs. With regard to the AIMS, TRADOC's commitment to self-pacing underscored the requirement for an efficient training management system. The need at the USAFAS was documented by the procurement request for an automated system to overcome the problems in their manual procedures for managing self-paced training. Thus, the documentation for the AIMS procurement at the USAFAS should provide all the information necessary to describe the Context which led to the AIMS program, and within which its evaluation will take place.

The second component of the CIPP evaluation model - INPUT - refers to the examination and comparison of alternative system designs in meeting program needs. This activity occurs early in a system's conceptual stage and results in the selection of one or more approaches or designs to meet the needs and objectives determined by the Context evaluation. The Input evaluation has been performed and documented in the study comparing the Computerized Training System, Memphis CMI, and the Versatile Training System (Bunderson, 1977). In addition, Systems Consultants, Inc. (SCI) has documented the training management requirements of all TRADOC service schools and Army Training Centers.

The third CIPP component - PROCESS - refers to an evaluation of how adequately a program's intended implementation plans and procedures are being carried out. This information is used during a program's early stages to help correct any deficiencies and improve the implementation process and conduct of the program. With respect to the AIMS, a Process evaluation should be continuously performed during the entire installation period at the USAFAS test site. This should include monitoring and documentation of implementation problems and their solutions. A formal assessment of the AIMS components by government acceptance tests of hardware/software and querying AIMS users should also be included in the evaluation of the AIMS process.

The fourth CIPP evaluation model component - PRODUCT - focuses on the outcomes of the program and examines them in relation to satisfying the needs identified previously. The information gathered in this evaluation, as in Process evaluation, is used for program modifications and improvements. Process and Product evaluation interact and should occur simultaneously. Whereas Product evaluation determines the extent to which objectives have been or are being attained, Process evaluation describes the procedures that were actually implemented, and this can provide an explanation for whether or not the objectives were achieved. Similarly, both types of evaluation provide feedback for changing a program's procedures. With respect to AIMS, the Product evaluation should be performed once the hardware/ software system has become stabilized and operational. Measures of the AIMS' outcomes should be obtained from online records as well as instruments to be administered offline.

It is clear from the above discussion of the application of the CIPP model to the AIMS evaluation, that data is available and has been used for decision-making regarding the Context and Input of the AIMS. The next section will focus on the purpose of the AIMS evaluation regarding the collection of the needed Process and Product data.

EVALUATION PURPOSE/ISSUES

The purpose of this plan is to: Evaluate the effectiveness of the AIMS in meeting TRADOC's training management needs. The appropriate focus for the Process and Product evaluation of the AIMS is formative. Operational and training effectiveness data will be collected at the Ft. Sill test site so that revisions can be made prior to AIMS distribution Army-wide.

The goal of the AIMS is to provide overall management support for TRADOC training programs. AIMS is intended to provide managers, instructors, administrators, and support personnel with an interactive computer system with which they can obtain:

- Student progress reports
- Training schedules
- Predictions of student graduation dates
- Prescriptions for remediation
- Test administration
- Test scoring
- Monitoring of student progress during training

A selection of AIMS software packages, identified in the previous section, will be operational at the USAFAS. The two USAFAS courses which will be used to test the AIMS are the Artillery Survey Specialist Course (MOS 82C10) and the Field Artillery Target Acquisition Specialist Course (MOS 17C10).

The approach taken in the proposed evaluation plan includes the following steps:

Step 1. Ensure that all parties concerned know about, understand, and agree to the proposed evaluation.

Step 2. Validate the USAFAS training management needs to be met by the AIMS.

Step 3. Examine match between needs and the AIMS' functions and characteristics using data collection instruments specific to the test site.

Step 4. Assess the AIMS operations in the two USAFAS courses.

Step 5. Provide input for modifications to the AIMS at USAFAS.

Step 6. Reassess the AIMS operations in the two USAFAS courses.

Step 7. Provide input for modifications to the AIMS to be installed at other TRADOC schools.

The evaluation will focus on the following components:

I. Hardware/Software

II. Training Management

III. Courseware

IV. Training Effectiveness

V. Cost

VI. Implementation/Organizational Factors

A list of evaluation questions has been formulated to guide the examination of each component. These questions were suggested by Orlansky and String (1979), Seidel, et al., (1978) and an analysis of the AIMS' objectives derived from the USAFAS needs identified by Systems Consultants, Inc. (SCI). These evaluation questions appear in the next section under their AIMS component headings.

EVALUATION QUESTIONS

I. Hardware/Software

I.1 Is the AIMS hardware/software configuration adequate for the Army's training and resource management needs at Ft. Sill (and other installations)?

I.2 What back-up capabilities are available during system down-time?

II. Training Management

II.1 Does data exist on each system participant and is access to this data limited to appropriate users?

II.2 Does a course catalog exist?

II.3 Is a list of training tasks maintained for each course?

II.4 Are tests administered, scored, and recorded according to instructors' specifications?

II.5 Are sufficient resources available to handle the student load?

II.6 Does a catalog exist describing all training materials?

II.7 How are instructors, students, and materials assigned to courses?

II.8 How useful are the AIMS-generated reports for instructors and training managers?

II.9 How accurate is the graduation prediction function?

II.10 Have in/out processing time and inconvenience been reduced?

II.11 Has student registration time been reduced?

II.12 Are all training reports (class rosters, etc.) produced in a timely manner?

II.13 Are all required training records and paperwork produced by AIMS?

II.14 Has the system been effective in monitoring students?

III. Courseware

III.1 What procedure is used by the instructor to define the instructional environment and strategy appropriate for each student?

III.2 Are tests constructed according to instructors' specifications?

III.3 How does the instructor determine the hierarchy of CMI lesson topics?

III.4 What feedback is available for revising instructional materials and tests?

III.5 Are the instructors able to develop courses according to the Instructional Systems Development Model?

III.6 How much time is required to prepare training and test materials contained in CMI courses?

III.7 What special problems, if any, were encountered when inputting materials on-line?

IV. Training Effectiveness

IV.1 What percentage of the students score above the cutoff for 80% of the tests?

IV.2 What percentage of the students fail to graduate the CMI courses?

IV.3 What are student attitudes towards the AIMS courses?

IV.4 What are instructor attitudes toward the AIMS?

IV.5 What unanticipated by-products can be attributed to the AIMS?

IV.6 How well do CMI course graduates perform on the job?

IV.7 What is the average length of time needed to complete the AIMS CMI courses?

V. Costs

V.1 What costs have been incurred to develop, deliver, staff, and maintain the AIMS?

V.2 What are the estimated costs to manually administer USAFAS self-paced courses?

V.3 What costs have been avoided by use of the AIMS at USAFAS?

VI. Implementation/Organizational Factors

VI.1 What was the status of the AIMS within USAFAS?

VI.2 Was there agreement or understanding on the purposes and goals of the AIMS prior to implementation?

VI.3 Were there clear lines of responsibility/authority within the AIMS program at USAFAS?

VI.4 Did instructors and other system users receive familiarization or other training on the AIMS as a "tool" for their benefit?

VI.5 Was the AIMS field test representative of conditions that would exist under normal operational conditions?

VI.6 Were there frequent meetings of user and AIMS project personnel to monitor the field test and enhance mutual understanding?

VI.7 Were key personnel assignments to the AIMS CMI courses sufficiently free of turbulence?

VI.8 What special qualifications should the AIMS instructional support staff have?

EVALUATION ACTIVITIES

Evaluative data on the AIMS will be collected by two approaches. In the first approach the software subsystems of the AIMS will be tested with data inputs (during government-conducted acceptance tests and actual AIMS operations). This will provide some answers to the evaluation questions concerning the hardware/software and training management of the AIMS (Components 1 and 2). The second approach will be to obtain the USAFAS records and to query or interview system users for information on courseware, training effectiveness, costs, and implementation/organizational factors (Components 3, 4, 5, and 6). This examination of records and interviews of system users will also provide information for Components 1 and 2.

The specific activities proposed in this evaluation plan are described below. A schedule of these activities and associated milestones is shown in Figure 1.

Activity 1. Obtain Contract Support

There is a need in any evaluation (formative or summative) for all concerned individuals to understand:

- Who and what is being evaluated
- How the assessment is to be made
- What criteria are to be used to judge the program
- Who is to do the data collection, analyses, and interpretation
- What decisions are to be made as a result of the study
- How much time, cost, and resources are required to implement the evaluation

Attaining this level of understanding by all concerned parties requires a set of explicit activities that should be an integral part of the management of this evaluation effort. As the purpose of this evaluation has been established as formative -- the findings are to be used for the improvement of subsequent AIMS implementations -- then this purpose must be clearly communicated to all concerned individuals. This is especially true when the evaluators are seen as "outsiders". In the proposed evaluation, ARI and its evaluation contractor could be perceived in this manner by the user (USAFAS) and/or the system developer (SCI).

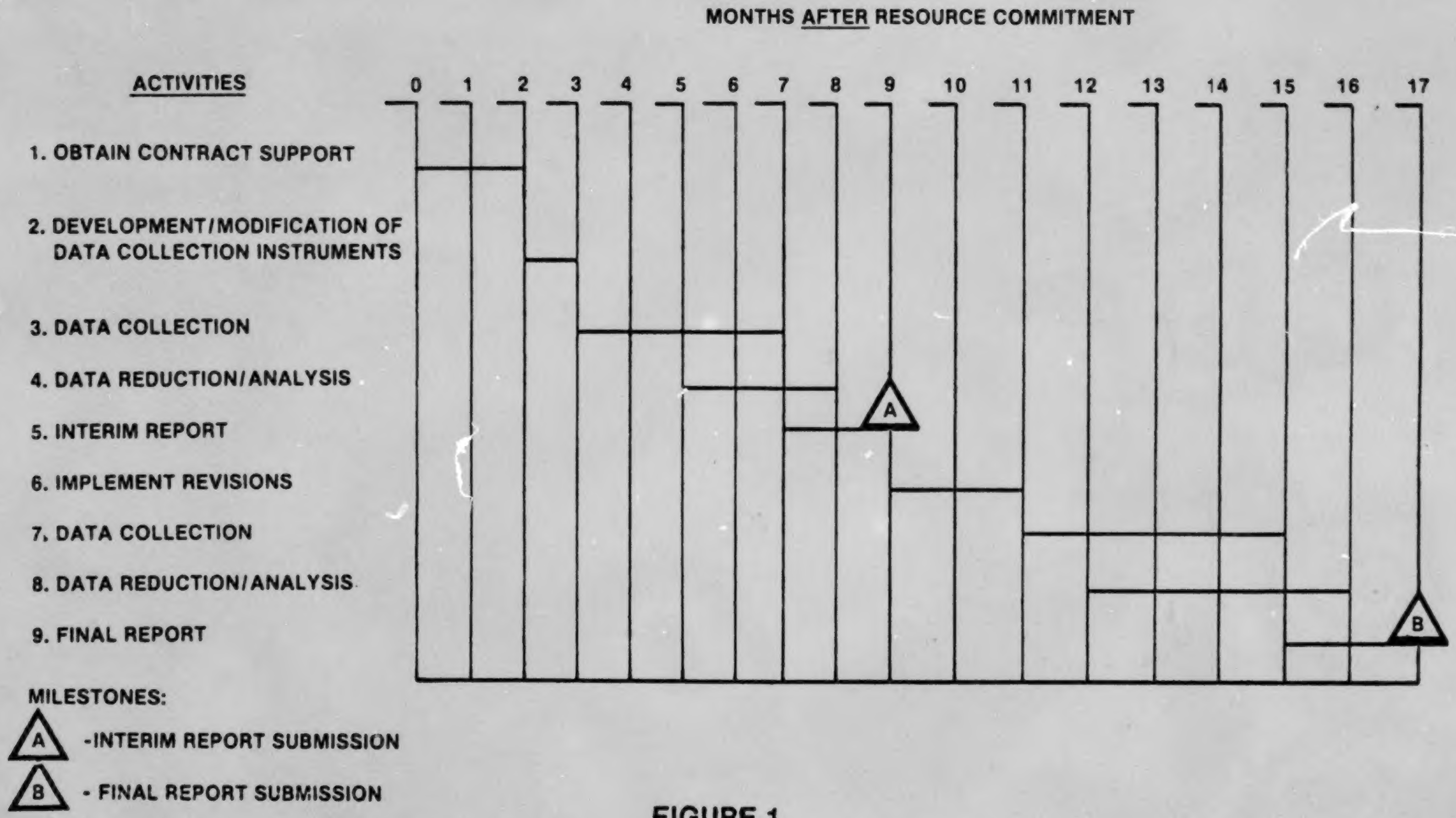

FIGURE 1
SCHEDULE OF EVALUATION ACTIVITIES/MILESTONES

Therefore, it is proposed that a set of formal and informal meetings/briefings be arranged to establish working relationships between all participants. The purpose of these meetings should be two-fold: (1) to communicate the purpose, procedures, and details of the evaluation plan, and (2) to involve the AIMS developer and users in setting evaluation priorities, contributing to data collection plans and activities, and determining how the evaluative information would be used to improve the AIMS. Attendees at these meetings should represent all interested or "concerned" parties to the AIMS implementation. These include: TRADOC (ATSC-MISO); USAFAS personnel (representatives from management, instructors, academic departments, departments of training development and evaluation, etc.); SCI project and site managers; and ARI and its evaluation contractor. Cooperation between all concerned is essential to the success of AIMS and its planned evaluation. One possible means for ensuring involvement of the system developer (SCI) in the formal evaluation is to contract for the development of software that permits on-line evaluative data collection/analysis on the AIMS.

Once a degree of understanding and cooperation has been achieved, and agreements are obtained regarding evaluation priorities, the specific evaluation procedures need to be discussed. Arrangements should be made for scheduling and supporting the data collection, analyzing the data, and reporting the findings for use in modifying the AIMS.

The outcome of this activity is the formal approval of the evaluation plan. This plan should be a formal document supplemented by Memoranda of Understanding that detail in specific terms the results of the above-described meetings to obtain interagency cooperation and coordination in terms of contract support.

Activity 2. Development/Modification of Data Collection Instruments

Interview schedules and survey instruments will be developed and/or modified to collect data of interest. Instrument development/modification will correspond with the AIMS evaluation components. Hardware/Software (Component 1) will be assessed by a series of on-line tests of the AIMS subsystems. Prior to the government's acceptance of the AIMS, tests will be conducted to determine whether the system meets the contract's specifications. The data collected should indicate the operational status of the hardware and software. In addition to these tests, the AIMS subsystems will be examined in operation. The hardware/software should not be tested until the AIMS has been in place and the staff is trained and experienced in its use.

The operational tests will also provide data on Training Management (Component 2). System users should be polled for information on the operation of the subsystems. Survey instruments from the Computerized Training System (CTS) Evaluation (Seidel, et al., 1978) have been modified to collect information on the Resource Configuration and Scheduling Subsystem (Attachment 1) and the Reports Generation Subsystem (Attachment 2).

Survey instruments are also available for Courseware (Component 3). These instruments when modified can provide the means for collecting data on the Computer-Managed Instruction (CMI) Subsystem and the Test and Evaluation Subsystem. The CMI Subsystem permits the creation and execution of self-paced training. Two survey instruments and an interview schedule which have been developed for the CTS are appropriate for examining the development and revision of the AIMS course materials (Attachments 3, 4, & 5). The creation, maintenance, and administration of a test item bank are also portions of the Courseware effort. Attachment 6 provides initial guidance for the design of an instrument to collect data on the usefulness and quality of the AIMS-constructed tests.

The fourth component of the AIMS evaluation plan is Training Effectiveness. According to Seidel and Wagner (1977), training effectiveness can be measured in terms of the graduate's ability to perform the tasks selected for training and the graduate's ability to perform on the job. The former measurement is made at the school while the latter must be made in the field. Orlansky and String (1979), in an analysis of the training and cost effectiveness of military computer-based instruction projects, indicated that data on post-graduation performance has not been collected. An examination of the job performance feedback system at USAFAS is needed to determine what instruments and procedures have to be developed to make these measurements. In the evaluation of the Advanced Instructional System (AIS), Dallman, et al., (1979) obtained supervisor ratings of AIS graduates' job performance one to three months after graduation. Also, graduates rated the appropriateness and usefulness of their training. A similar assessment procedure could be adopted for the AIMS.

Seidel and Wagner (1977) suggest the following types of training effectiveness measures: absence rates, accuracy scores, achievement measures, attitude scales, attrition rates, and training time. The AIMS is designed to record within-course training effectiveness data. The CMI Subsystem provides a timekeeping function. Achievement and accuracy data are recorded by the Test and Evaluation Subsystem. It is anticipated that the Reports Generation Subsystem could produce data in the desired format. Attitude questionnaires will be needed for all types of AIMS users. Categories of system users include students, instructors, training specialists, educational specialists, instructional programmers, battery clerks, registrars, and the Commander. Student attitude questionnaires have been modified for the AIMS evaluation (Attachments 7 & 8).

It is possible that all data collection instruments could be administered at the AIMS terminals and tabulated by the Test and Evaluation Subsystem. Some additional software development may be needed for this capability.

Cost effectiveness data (Component 5) will require the development of AIMS-specific data collection instruments. Some of the cost data Orlansky and String (1979) recommend for collection include: program design, delivery, management, personnel, and equipment. The Cost-Effectiveness Specification for Computer-Based Training Systems (Seidel and Wagner, 1977) can be used as a framework provided that the appropriate cost data are available and can be collected at USAFAS. A list of cost categories derived from the Seidel and Wagner (1977) document appears in Attachment 9.

When performing an evaluation in an operational environment, it is important to completely document that environment, attending to those factors which probably influence results (Dallman, et al., 1979). It is clear that such factors as instructor bias, unstable system components, unclear lines of responsibility, and unrealistic student loads can negatively affect outcomes of computer-based instructional systems. Structured interviews need to be developed for use with the USAFAS management and instructional personnel, and with the AIMS project personnel to obtain information on implementation and organizational factors (Component 6). Work sample observations (similar to those employed by Dallman, et al., 1979, Attachment 10) can be used to identify the AIMS' instructional manpower requirements. Implementation and organizational factors influencing the success of a training management system can also be revealed in instructor and staff attitude surveys (Attachments 11 and 12).

A list of the data collection instruments/procedures discussed in this section is presented in Table 1 on the following page.

Activity 3. Data Collection

The questionnaires, student records, interviews, and other instruments described in the previous section will be initially administered at USAFAS during a four-month period (as shown in Figure 1). This period is to coincide with the implementation of the Artillery Survey Specialist Course

TABLE 1
EVALUATION COMPONENT/INFORMATION SOURCES

AIMS Evaluation Component	Information Sources
I. Hardware/Software	Acceptance Tests Systems Logs (Maintenance) Attachment 2 (Section IV) Attachment 3 (Questions 8-10) Interviews
II. Training Management	Attachment 1 - Resource Configuration and Scheduling Survey Attachment 2 - Reports Generation Survey
III. Courseware	Attachment 3 - Course Materials Development Survey Attachment 4 - Revised Training Materials Survey Attachment 5 - Course Development Interview Attachment 6 - Test and Evaluation Survey Interviews Observations
IV. Training Effectiveness	Student Records Achievement scores and other measures as noted in Cost-Effectiveness Specification, Vol. 3 (pp. 67-93) Seidel and Wagner, 1977. Attachment 7 - Student Attitude Questionnaire Attachment 8 - CMI Attitude Questionnaire Field Feedback Reports Interviews
V. Costs	Cost Data Time Logs Contractor Reports Cost-Effectiveness Specification (Vols. 1 & III, pp. 5-66) Seidel and Wagner, 1977 Attachment 9 - Cost Categories
VI. Implementation/ Organizational Factors	Observations (Work Sample) Observations (Attachment 10 - Instructor Task List) Attachment 11 - Instructor Attitude Survey Attachment 12 - Staff and Faculty Attitude Survey Interviews

(MOS 82C10) and the Field Artillery Target Acquisition Specialist Course (MOS 17C10). The specific schedule for questionnaire/interview administration will be established soon after formal approval of the evaluation plan.

As many instruments as possible should be administered and/or tabulated on-line. It must be recognized that the school's goal is to train its students in a timely manner. Therefore, a back-up manual training management system will need to remain operational until the AIMS has been debugged sufficiently and stabilized.

Persons engaged in the evaluation effort will need to work closely with USAFAS and SCI personnel during this period. Data gathered at this time are to be used for immediate revisions or modifications of the AIMS. SCI and/or USAFAS personnel must be made aware of problems as soon as they occur. Such problems and their solutions should then be documented.

Activity 4. Data Reduction/Analysis/Reporting

Evaluation data gathered on-line regarding hardware/software, training management, and courseware (Components 1, 2, and 3) will need to be reported to those who must use the information to make changes in the AIMS. Such reports should be produced automatically by the AIMS but may need to be summarized for presentation to the users.

Activity 5. Interim Report

This report will document the formative evaluation activities and findings that are recorded during the initial application of the AIMS to the two USAFAS courses. This report will also include:

- Description of the initial AIMS operations
- Comparison of USAFAS training management needs and AIMS functions
- Discussion of lessons learned
- List of recommendations for modifying the AIMS to facilitate its implementation in other USAFAS courses

Activity 6. Implement Revisions

Modifications and additions to the AIMS will be made based on the suggestions of the Interim Report. Research on maximizing the effectiveness of computer-managed training will be conducted at this time.

Activity 7. **Data Collection**

The same procedures described in Activity #3 above will be re-initiated for an additional four-month period. The findings and recommendations described in the Interim Report will have been transmitted to the AIMS developers and users. It is expected that modifications to AIMS based on these recommendations will have been made, so the focus of data collection in this second period will be on the effectiveness of these revisions. It is possible that long-term data such as job performance feedback may be obtained during this period. Cost comparison data within the USAFAS can also be gathered.

Activity 8. **Data Reduction/Analysis**

This activity is essentially the same as described in Activity #4 above. The focus will be on lessons learned that can be used as guidance for the AIMS installations at other TRADOC schools.

Activity 9. **Final Report**

The formative evaluation will be completed with the submission and distribution of a final report that includes the following:

- Description of AIMS field test at USAFAS
- Description of evaluation activities
- Findings/conclusions for each AIMS evaluation component
- Cost analysis and projections (if feasible)
- Guidance for subsequent AIMS installations at TRADOC schools

Based on data gathered and lessons learned during this field test, a document will be prepared to guide the next generation of Army computer-based training systems in the management of instruction. Whereas the immediate results of this formative evaluation will aid the AIMS implementation at the USAFAS, the long-term use of the data is to provide an empirical and analytical basis for computer-based approaches to training delivery.

COMPARATIVE ANALYSIS

The present evaluation plan does not include a comparative study between computer-managed and manually-managed instruction. The division of AIMS users into experimental and control groups is not recommended for its initial implementation at USAFAS for three reasons:

(1) The system is in a formative, relatively unstable condition and thus not representative of other sites,

(2) As AIMS is phased in, the manual mode is simultaneously being phased out, and

(3) The most value to be derived from an evaluation at this stage is to use the information to improve the AIMS.

However, some initial comparative data may be collected at the USAFAS if the two courses are still conducted in the manual mode. This data should be collected during the latter part of the proposed study period. By that time, improvements will have made and more accurate cost and training effectiveness estimates can be determined. These data should also be collected at the second and third AIMS installations so that a more complete cost and training effectiveness analysis can be made. The Cost-Effectiveness Specification for Computer-Based Training Systems previously discussed (Seidel and Wagner, 1977) could serve as the framework for these analyses.

The following section summarizes the staffing required to implement the AIMS evaluation plan presented in this document. The qualifications of each needed staff member is indicated with a summary of job tasks and estimate of person months required to accomplish the job tasks.

DESCRIPTION OF STAFF REQUIRED TO IMPLEMENT AIMS EVALUATION PLAN

A - All activities up to and including Interim Report
B - All activities up to and including Final Report

	Estimated Person Months	
	A	B
1 Senior Research Scientist - Evaluation Specialist Experienced in evaluation planning, design, and methods - particularly with regard to computer-based instruction. Tasks: AIMS evaluation planning and design, inter-agency coordination, management of evaluation activities, reporting.	6	9
2 Research Scientists Experienced in evaluation techniques, instrument development, interviewing, cost-effectiveness analysis, reporting. Tasks: AIMS evaluation instrument development, data collection, conduct structural interviews, data analysis/interpretation, reporting.	8	12
1 Site Manager - Research Scientist Experienced in evaluation methodology, liaison with military school personnel. Tasks: Oversee on-site data collection activities, liaison between USAFAS, SCI, and ARI, reporting.	7	12
1 Research Associate/Assistant Experienced in instrument development data collection, reduction, and analysis. Tasks: Revise, test, and administer data collection instruments, summarize data, support site manager.	7	9

	Estimated Person Months	
	A	B
2 Programmers Experienced in AIMS software subsystem development. Tasks: Prepare programs that provide data collection instruments on-line, analyze data, and tabulate findings into properly formatted reports.	4	4
2 Clerk Typists Experienced in typing data collection instruments, use of job entry data terminals. Tasks: Type reports, enter data for analysis, type and reproduce interim and final reports.	3	4

This staffing plan assumes that all evaluation activities are performed in a seventeen-month period; student and school records are made available upon request by USAFAS personnel; school and AIMS development personnel (USAFAS, SCI, etc.) are available for on-site interviews as scheduled; and programs can be written to provide automated data collection, analysis, and reporting on the AIMS.

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ATTACHMENTS

Attachment 1

RESOURCE CONFIGURATION AND SCHEDULING SURVEY AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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RESOURCE CONFIGURATION AND SCHEDULING SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

DATE____________________

The purpose of this survey is to collect information on the allocation of resources within your area. The results will be consolidated with other surveys to determine the effectiveness of the Automated Instructional Management System (AIMS).

As you read the statements and questions, make a mental comparison of your training area prior to and after the implementation of the Automated Instructional Management System.

Please place a check (✓) mark by your position below.

Position

_____Instructor

_____Section Chief

_____Course Chief

_____Division Chief

_____Education Specialist

_____Training Specialist

_____Records Clerk

_____Other

RESOURCE CONFIGURATION AND SCHEDULING SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	YES	NO	COMMENTS
1. The computer system has been able to accurately account for the location of each student within the course.			
2. The computer system has maintained an accurate accounting of student position vacancies.			
3. When the student completes a task, the system routes him/her to the next task without delay.			
4. Students are routed through the course according to the predetermined (normal) flow.			
5. Student routing has been accomplished with a minimum of errors.			

RESOURCE CONFIGURATION AND SCHEDULING SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
6. When student positions in the next sequential task are filled, the student is routed to an alternate task, for which he/she has the necessary prerequisites.						
7. When the student completes a task and all student positions in the succeeding tasks are filled, the instructor is alerted.						
8. Routing students to the correct student positions has required close monitoring by the instructor/supervisor.						
9. The instructor is alerted when the student has completed all the required tasks.						

---

10. Prior to the AIMS, did accounting for student time in the course place an unnecessary burden on the classroom instructor? Yes_____ No_____
Explain.

11. Does the usefulness drived from using the computer for accounting for students' time outweigh the workload in its collection? Yes_____ No_____
Explain.

RESOURCE CONFIGURATION AND SCHEDULING SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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12. What is your frank opinion of the capability of the computer system to route and account for students within your course? (Please indicate advantages and disadvantages)

Advantages	Disadvantages

Attachment 2

REPORTS GENERATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

REPORTS GENERATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

DATE____________________

The purpose of this survey is to collect information on the reports generated by the AIMS to help maintain student records and provide information for managing self-paced training. This information will be analyzed with the idea of making record keeping simpler and reporting more useful.

Please indicate your position below by a check mark (✓). If more than one position applies, make additional check marks.

_______Dept. Operations Chief

_______Dept. Education Specialist

_______Dept. Course Materials Analyst

_______Dept. Records Clerk

_______Division Chief

_______Division NCOIC

_______Course Chief

_______Course NCOIC

_______Course Training Specialist

_______Course Section Chief

_______Course Instructor

The following is a glossary of terms which will assist you in answering the questions:

- On-line Testing - Using the computer to administer, score, and record.
- Diagnostic Tests (quizzes) - An informal test.
- Regularly - At regular times or intervals.
- Occasionally - Now and then.
- Seldom - On only a few occasions.
- On-line - Interaction of operating a terminal with the computer.
- Downtime - An interval of time when the computer is not productive.

REPORTS GENERATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
SECTION 1. Weekly AIMS Reports. 1. The AIMS has reduced the time the classroom instructor spends on student records.						
2. Weekly AIMS printouts enable rapid analysis of student accomplishment in relation to his/her peers.						
3. The ability to display student records on the terminal a. provides effective feedback on student effectiveness						
b. saves time in assessment of student needs.						
4. The AIMS has had no impact on student record keeping at the division/department level.						

REPORTS GENERATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	**STRONGLY AGREE**	**AGREE**	**NEUTRAL**	**DISAGREE**	**STRONGLY DISAGREE**	**COMMENTS**
5. The AIMS has been successful in routing students determined by their prior accomplishments in the course.						
6. The AIMS reports enable course managers to a. assess trends as they develop						
b. update the instructional process with minimum delay.						
7. The AIMS student record printouts enable the instructor to a. analyze student progress						
b. provide individual assistance						
c. prescribe remedial training.						

REPORTS GENERATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
8. Recording no-goes in the weekly report has assisted in managing the student through the course.						

REPORTS GENERATION SURVEY

SECTION II. AIMS-Generated Reports

For each type of report generated by AIMS

(Title of Report)

1. Are you familiar with this report? _____Yes _____No
   (If No, turn page to next report).

2. Is this report available to you?

   a. ______________Regularly available
   b. ______________Occasionally available
   c. ______________Seldom or never available

3. How frequently do you use this report?

   a. ______________Regularly
   b. ______________Occasionally
   c. ______________Seldom or never

4. How accurate is this report?

   a. ______________Generally accurate
   b. ______________Minor inaccuracies
   c. ______________Numerous errors
   d. ______________Cannot judge accuracy of report

5. What is your opinion about the format of this report?

   a. ______________Excellent format
   b. ______________Format is satisfactory
   c. ______________Format requires revision
   d. ______________No opinion

6. The information contained in this report is

   a. ______________Essential
   b. ______________Non-essential

7. The content of this report

   a. ______________Should not be changed
   b. ______________Needs minor revisions in the content
   c. ______________Needs major revisions in the content

REPORTS GENERATION SURVEY

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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8. How useful do you find this report?

    a. ______________Serves intended purpose
    b. ______________Of marginal use
    c. ______________Serves no useful purpose

COMMENTS:____

____

____

9. The objective of the AIMS______________________Report is to provide the course manager with timely information concerning student progress and achievement.

    a. How well do you think the AIMS______________________Report has met this objective?

    b. Has the expanded AIMS______________________Report provided you with a better management tool? Explain.

    c. Is the revised AIMS________________________Report received in time to assist the course/division/department in completing the student records? Explain.

    d. Has AIMS improved the timeliness of the student graduation prediction? Explain.

    e. Should any additional items be included or deleted from the AIMS________________________Report? If yes, explain.

---

10. Does the AIMS provide your course(s) with the necessary operational reports? If not, please list and describe any additional reports you think are necessary.

11. What AIMS reports are not necessary? List and explain.

SECTION III. Student Record.

The student record file was created to provide real time access to individual student records, both on-line and printouts, as required by the primary instructor or course managers.

1. Does the student record contain the necessary information to enable you to:

    a. Analyze a student's progress? Explain.

    b. Prescribe remedial training? Explain.

    c. Take action to separate the student from the course? Explain.

2. Have you experienced any problems in using the terminal to call up a student's record? If yes, explain.

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3. When you call for a student's record on-line, is there any appreciable time lag in obtaining the display? If yes, explain.

4. Has the printout of the student's record been available on a timely basis? If no, explain.

5. Does the student record contain the necessary data to support the counselling and guidance program in your course? If no, explain.

6. Do you use the student record printout to support faculty board actions? Please explain.

7. What additional information do you need in the student record?

SECTION IV. Computer Downtime and Updating Reports.

(Answer the following questions with a "yes" or "no" and explain your answer.)

1. Does computer downtime interrupt the normal flow of AIMS reports?

REPORTS GENERATION SURVEY

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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2. Did the computer downtime result in any of the following:

   a. Irretrievable loss of student data?

   b. Delay in student graduation?

   c. Distortion of students' data on his/her progress?

   d. Hand processing of student data?

   e. Overtime (extra) work for administrative personnel?

   f. Delay in training until the system was restarted?

   g. Explain any special problems not listed above.

3. Did the temporary delay of recurring reports adversely affect student training?

REPORTS GENERATION SURVEY

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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4. Do you consider computer downtime a major drawback to the AIMS?

5. Following computer downtime, was it necessary to manually record and input student data into the system to update any of the AIMS-generated reports? If yes, identify the report and explain the problems you had.

6. Have you experienced any problems with these AIMS-generated reports because of loss of data during downtime? Yes______ No______. If yes, identify the report and describe the problems you had.

7. Were any particular problems, not discussed above, encountered in up-dating reports following computer downtime?

8. Was it necessary to maintain a dual set of manually maintained student records to insure continuity during downtime?

9. Please list and explain any problems encountered with the AIMS-generated reports not previously covered.

Attachment 3

COURSE MATERIALS DEVELOPMENT SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

COURSE MATERIALS DEVELOPMENT SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

DATE____________________

The purpose of this survey is to gather information concerning the development of AIMS instructional materials. Please answer all items in this survey as factually and completely as possible, and with complete candor. Your responses will be held in strictest confidence. If you feel that you are not in a position to answer a particular item because you have not been closely associated with the AIMS project, please circle the item number and leave it blank. Your comments or suggestions will be greatly appreciated.

Please indicate (✓) your position relative to AIMS:

_____Instructor

_____Instructional Programmer

_____Section Chief

_____Course Chief

_____Division Chief

_____Education Specialist

_____Training Specialist

_____Other

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COURSE MATERIALS DEVELOPMENT SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
1. Instructional programmers must oversee the input of course materials by entry specialists and/or Clerk-Typists.						
2. Delays were experienced in entering instructional materials on-line because of the shortage of Clerk-Typists.						
3. Clerk-Typists experienced little or no difficulty in entering lesson material or logic coding into the system.						
4. Logic coding of lesson materials has caused relatively few problems when entering materials into the system.						
5. Editing materials on-line has been compounded by Clerk-Typist typing errors.						

COURSE MATERIALS DEVELOPMENT SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	**STRONGLY AGREE**	**AGREE**	**NEUTRAL**	**DISAGREE**	**STRONGLY DISAGREE**	**COMMENTS**
6. Little difficulty was experienced when deleting or adding new or revised AIMS instructional materials on-line.						
7. A complete AIMS unit of instruction can be changed overnight eliminating any delay in student progress.						

8. What problems were encountered when inputting and "saving" lesson material during the process of entering courseware on-line?

9. How much adverse effect, if any, has computer down-time had on entering of materials on-line? Explain.

COURSE MATERIALS DEVELOPMENT SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

10. Did waiting for system restarts delay the preparation of instructional materials? Explain.

11. What special problems did you encounter when logic coding lesson materials?

REVISED AND ALTERNATE TRAINING MATERIALS SURVEY AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

Attachment 4

REVISED AND ALTERNATE TRAINING MATERIALS SURVEY AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

REVISED AND ALTERNATE TRAINING MATERIALS SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

DATE____________________

The purpose of this survey is to gather information concerning revision and validation of AIMS course materials, as well as alternate training material requirements.

Please answer all items in this survey with complete candor. Your responses will be held in strictest confidence. The results of this survey will enable the revision and validation of training materials to be more effective.

If you feel that you are not in a position to answer a particular question because you have not been closely associated with the AIMS project, please circle the item number and leave it blank. Your comments or suggestions will be greatly appreciated.

Please indicate (✓) your position relative to AIMS:

_______Instructor

_______Instructional Programmer

_______Section Chief

_______Course Chief

_______Division Chief

_______Education Specialist

_______Training Specialist

_______Other

REVISED AND ALTERNATE TRAINING MATERIALS SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
SECTION 1. Revision and Validation of Training Materials.						
1. The AIMS provides more flexibility in revising instructional materials than does the self-paced system.						
2. Little difficulty has been experienced in revising a. Individual display						
b. Tests						
c. Units of Instruction						
d. Flow of instruction						
3. The AIMS review process has reduced the time normally required for introducing new or revised materials into the classroom.						

REVISED AND ALTERNATE TRAINING MATERIALS SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
4. The AIMS instructional materials can be introduced into the course without the usual printing requirement procedures.						

REVISED AND ALTERNATE TRAINING MATERIALS SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	YES	NO	COMMENTS
SECTION II. Back-up Training Materials 5. Was it necessary to prepare back-up training materials to be used exclusively to cover computer downtime? If yes, please explain.			
6. Were course personnel, other than instructional programmers, used to prepare back-up training materials to cover computer down-time? If yes, please explain.			
7. Did the requirement to develop back-up training materials increase the workload for the course writers? If yes, what percentage?			
8. In determining course resource requirements, should additional personnel be programmed to handle the preparation of back-up materials? Please explain.			
9. Do you think there is a legitimate requirement to develop back-up instructional materials for all AIMS instruction?			

REVISED AND ALTERNATE TRAINING MATERIALS SURVEY

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

SECTION III. General Summary.

10. Have you encountered any special problems in preparing the AIMS instructional materials not noted when preparing prior self-paced materials?

11. How would you change the present system of revising lesson materials to insure adequate back-up for the AIMS instruction?

12. What problems peculiar to the AIMS were encountered when using small and large student groups for validation of training materials?

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

The Course Development Interview provides a structure for the Interviewer gathering data from Instructional Developers. Each Developer selected for an interview will be asked the questions that appear on the following pages.

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME: ______________________________

COURSE: ______________________________

	% of Time Spent
a. Planning, Course Outlines, Strategies	________
b. Original Authoring (writing, typing, coding)	________
c. Converting Existing Materials	________
d. Modifying Materials due to POI Changes	________
e. Reviewing, Debugging, & Testing, Materials	________
f. Revising Materials	________
g. Coordination	________
h. Other ______________________	________

COURSE DEVELOPMENT SUMMARY SHEET
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME: ____________________ POSITION: ____________________

DATE: ____________________

Course(s) worked on:

	Course	Section	Position
1.			
2.			
3.			
4.			
5.			
6.			

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME: ______________________________ DATE: ________________

What feedback is available for you to use in revising instructional materials and tests?

How have you used it? ______________________________________

What additional feedback would you like to have? __________

How would you use it? ______________________________________

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME: ______________________________ COURSE: ________________

What special qualifications are required by the instructional support staff?

a. Instructional Programmers

b. Course Development Personnel

c. Computer Service Personnel

d. Entry Specialists

e. Other (specify)

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME:______________________________ COURSE:________________

What administrative and personnel costs were incurred to establish inservice training programs?

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME: ______________________________ COURSE: ________________

What difficulties have been encountered in fitting the previously developed self-paced instructional materials into the AIMS management structure?

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME:______________________________ COURSE:_________________

What special problems, if any, were encountered when entering (inputting) materials on-line?

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME:______________________________ COURSE:________________

What was the number and percentage of students who failed to graduate from each AIMS course?

COURSE DEVELOPMENT INTERVIEW
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

NAME:______________________________ COURSE:________________

What is the average training time for each AIMS course? How many graduates were there in each course?

Attachment 6

TEST AND EVALUATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

TEST AND EVALUATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

DATE:____________________

The purpose of this survey is to collect information on the tests produced by the AIMS. The results will be consolidated with other surveys to determine the effectiveness of the AIMS. Your responses will be held in strict confidence.

Please place a check (✓) mark by your position below.

_______Instructor

_______Instructional Programmer

_______Section Chief

_______Course Chief

_______Division Chief

_______Education Specialist

_______Training Specialist

_______Other

TEST AND EVALUATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
1. On-line pretests are effective in diagnosing student knowledge of the instructional unit.						
2. The results of the pretests are good predictors of student accomplishment.						
3. On-line pretests are not a factor in routing students through the course.						
4. On-line pretest results have little impact on student performance.						
5. Since pretests are optional, most students elect not to take the pretest.						

TEST AND EVALUATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
6. Of the students who elect to take the pretests, the majority fail.						
7. Posttests have been effective in measuring student accomplishment.						
8. Distractor counts have identified weaknesses in the instructional materials.						
9. Pretest and posttest distractor counts have pinpointed deficiencies inherent in the test questions.						
10. Posttests have proved to be highly successful in routing the student into his/her proper learning alternative.						

TEST AND EVALUATION SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
11. Distractor counts have enabled instructional programmers to make timely revisions to questions and training materials.						
12. Because of misspelling and improper phrasing, more unanticipated responses have surfaced than expected.						
13. Unanticipated responses are useful when revising instructional material.						

Attachment 7

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

This is a questionnaire to gather information about the Automated Instructional Management System (AIMS). There are no right or wrong answers. Rather, we are interested in your candid opinion of the following statements. Your complete frankness in recording your opinions will be greatly appreciated. Individual responses will be held in strictest confidence.

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	**STRONGLY AGREE**	**AGREE**	**NEUTRAL**	**DISAGREE**	**STRONGLY DISAGREE**	**COMMENTS**
SECTION I. Course Content and Instructional Media 1. The objectives of the course are clear and I know what is expected of me.						
2. The material in each unit is organized in a way that I can learn.						
3. The overall course content holds my interest.						
4. The lesson material makes you think.						
5. I cannot learn what I want to learn with this kind of instruction.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
6. Generally, the lessons are hard to understand.						
7. Generally, the lessons are too long.						
8. The level of reading skill required in most lessons is too high.						
9. Performance examinations cover what is presented in the lessons.						
10. Generally, the lessons seem to be planned just for me.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	**COMMENTS**
11. I learned the course material very quickly using this method of instruction.						
12. I find myself hurrying through a lesson to get it over with rather than trying to learn.						
13. I answer questions wrong intentionally (pretest, posttest) in order to get more instruction.						
14. I waste no time using this method of instruction.						
15. I do my best as a result of this method of instruction.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
16. I always know how well I am doing in this course.						
17. The AIMS is a very effective method of instruction.						
18. I feel that no one really cares whether I learn or not using this method of instruction.						
19. I feel that I am pushed too rapidly through the lesson material.						
20. An instructor is readily available for assistance.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
21. The instructors can answer my questions.						
22. There is a good working relationship between the instructors and myself.						
23. Background noise (voices, movement, operation of equipment) is distracting.						
24. Working in the carrels and other student positions becomes tiresome over a long period of time.						
25. There are so many devices (computer terminals, TV/cassettes, slide projectors) to operate that it distracts from the instruction.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
26. Constant changes from one instructional medium to another interferes with learning.						
27. The computer terminals are inoperative too often, which wastes my time.						
28. The computer terminal is easy to operate.						
29. The computer terminal text displays are clear and easy to read.						
30. The amount of material presented on the individual terminal displays is not excessive.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
31. Graphic displays on the computer terminal are sharp and easy to understand.						
32. I had no problem in learning to use the keyboard at the computer terminal.						
SECTION II. CMI Mode (Material presented off-line under computer management). 33. I prefer receiving all my assignments via the computer terminal.						
34. Most of my time in the course is spent in the CMI mode.						
35. The instructors kept referring me to computer terminal for directions rather than answering my questions about off-line assignments.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
36. I had no difficulty in getting to use a computer terminal whenever it was necessary.						
37. I feel that the AIMS instruction is too impersonal with so much time spent in the CMI mode.						
38. Computer down time did not affect my progress through the course.						
39. It was difficult for me to determine my next training task when the computer system was down.						
40. You always know exactly where you stand in the course when in the CMI mode.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
41. I like the feeling of independence associated with computer-managed instruction.						
42. I would rather receive my off-line assignments from an instructor so I can ask questions and clarify any points that I don't understand.						
43. I would like to have more instruction in the CMI mode.						
44. I would rather go through the course at the same speed as the other students as I seem to learn more in a group.						
45. It is easier to connect learning elements in the CMI mode than it is under other types of instruction I have experienced.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
46. I have experienced no problems in moving through the course in CMI mode.						
47. Instruction received via the computer terminal are clear, concise, and easy to follow.						
48. I feel that my progress would be faster if my course activities were controlled by the classroom instructor.						
49. Not being able to ask the instructor a question immediately when a problem occurred has made learning more difficult for me.						
50. There were not enough computer terminals in the course to meet all the student requirements.						

STUDENT ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
51. Too much waiting occurred because the computer terminals were down for maintenance.						
52. Waiting to get a computer terminal caused me to lose time in getting through a course.						
53. I would prefer to have a computer terminal at each classroom position.						
54. In my course there were too many students for the number of computer terminals available.						
55. The best configuration for the AIMS is to cluster the computer terminals in one classroom.						

Attachment 8

COMPUTER-MANAGED INSTRUCTION ATTITUDE QUESTIONNAIRE AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

COMPUTER-MANAGED INSTRUCTION ATTITUDE QUESTIONNAIRE
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

The purpose of the following questionnaire is to collect student opinions about Computer-Managed Instruction (CMI). There are no right or wrong answers. Rather, we are interested in your candid opinion. Individual responses will be held in strict confidence.

NOTE: The Pretest Questionnaire is designed to be administered prior to the CMI course and the Posttest Questionnaire is designed to be administered at the conclusion of the course.

PRETEST COMPUTER-MANAGED INSTRUCTION QUESTIONNAIRE

CIRCLE THE LETTER OF YOUR CHOICE FOR EACH ITEM.

1. When I am trying to learn something, it is important to me to know where I stand in comparison to others.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

2. I would like to take a CMI (Computer-Managed Instruction) course.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

3. Taking a CMI course would make me nervous.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

4. Taking a CMI course would be more interesting than taking the same course taught in some other way.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

5. People should be taught by other people, not by machines.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

6. I feel very uncomfortable when others know that I've made a mistake.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

7. I think I would feel isolated and alone while taking a CMI course.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

8. I like it when I can immediately find out where I have made my mistakes.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

9. It would be boring to take a CMI course.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

10. I think it would be easy to understand the material in a CMI course.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

11. Students are being treated more and more like IBM cards.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

12. Taking a CMI course would be too mechanical.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

13. I think I would feel challenged to do my best work while taking a CMI course.

    (a) All the time
    (b) Most of the time
    (c) Some of the time
    (d) Only occasionally
    (e) Never

14. I don't like to have my errors pointed out to me.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

15. I would prefer to have most courses taught as CMI rather than by other teaching methods.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

16. Most courses could be managed more effectively by a regular teacher than by computer.

    (a) Strongly agree
    (b) Agree
    (c) Undecided
    (d) Disagree
    (e) Strongly disagree

POSTTEST COMPUTER-MANAGED INSTRUCTION QUESTIONNAIRE

CIRCLE THE LETTER OF YOUR CHOICE FOR EACH ITEM.

1. The way the material was presented to me made me feel that no one really cared whether I learned or not.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

2. I was not concerned when I missed a question because no one was watching me anyway.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

3. The method by which I was told whether I had given a right or wrong answer became boring.

   (a) Strongly agree
   (b) Agree
   (c) Undecided
   (d) Disagree
   (e) Strongly disagree

4. I was concerned that I might not be understanding the material.

   (a) All the time
   (b) Most of the time
   (c) Some of the time
   (d) Only occasionally
   (e) Never

5. The responses to my answers were appropriate.

   (a) All the time
   (b) Most of the time
   (c) Some of the time
   (d) Only occasionally
   (e) Never

6. I felt uncertain as to my performance compared to the performance of others.

    (a) All the time
    (b) Most of the time
    (c) Some of the time
    (d) Only occasionally
    (e) Never

7. I knew whether my answers were correct or not before I was told.

    (a) Quite often
    (b) Often
    (c) Occasionally
    (d) Seldom
    (e) Never

8. I found myself just trying to get through the lesson rather than trying to learn.

    (a) All the time
    (b) Most of the time
    (c) Some of the time
    (d) Only occasionally
    (e) Never

9. I guessed at the answers to questions.

    (a) Quite often
    (b) Often
    (c) Occasionally
    (d) Seldom
    (e) Very seldom

10. I was able to work at my own pace.

    (a) All the time
    (b) Most of the time
    (c) Some of the time
    (d) Only occasionally
    (e) Never

11. I was aware of efforts to suit the material specifically to me.

    (a) Quite often
    (b) Often
    (c) Occasionally
    (d) Seldom
    (e) Very seldom

12. I found it difficult to concentrate on the course material because of the machine.

- (a) All the time
- (b) Most of the time
- (c) Some of the time
- (d) Only occasionally
- (e) Never

13. Computer-managed instruction made it possible for me to learn quickly.

- (a) Strongly agree
- (b) Agree
- (c) Undecided
- (d) Disagree
- (e) Strongly disagree

14. Questions were asked which were not relevant to the material presented.

- (a) All the time
- (b) Most of the time
- (c) Some of the time
- (d) Only occasionally
- (e) Never

15. Based upon my experience with this course, I prefer CMI to other methods of instruction.

- (a) Strongly agree
- (b) Agree
- (c) Undecided
- (d) Disagree
- (e) Strongly disagree

16. When I am trying to learn something, it is important to me to know where I stand in comparison to others.

- (a) Strongly agree
- (b) Agree
- (c) Undecided
- (d) Disagree
- (e) Strongly disagree

17. I would like to take another CMI course.

- (a) Strongly agree
- (b) Agree
- (c) Undecided
- (d) Disagree
- (e) Strongly disagree

18. Taking a CMI course made me nervous.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

19. The material managed by computer was more interesting than taking similar material managed in some other way.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

20. People should be taught by other people, not by machines.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

21. I feel very uncomfortable when others know that I've made a mistake.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

22. I felt isolated and alone while working with the computer.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

23. I liked it when I was able to find out where I had made my mistakes.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

24. It was boring to learn material managed by computer.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

25. It was easy to understand the CMI course material.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

26. Students are being treated more and more like IBM cards.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

27. Courses managed by a computer were too mechanical.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

28. I felt challenged to do my best work while in a CMI course.

(a) All the time
(b) Most of the time
(c) Some of the time
(d) Only occasionally
(e) Never

29. I don't like to have my errors pointed out to me.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

30. I would prefer to have most courses taught as CMI rather than by other teaching methods.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

31. Most courses could be managed more effectively by a regular teacher than by computer.

(a) Strongly agree
(b) Agree
(c) Undecided
(d) Disagree
(e) Strongly disagree

COST CATEGORIES
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

This list indicates the categories of costs incurred for Computer-Based Training Systems. It is proposed that the Seidel and Wagner (1977) Cost-Effectiveness Specification be used for the collection of this data on the AIMS.

COST CATEGORIES
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

Categories

1. Equipment
   - 1.1 Computer(s)
   - 1.2 Terminal(s)
   - 1.3 Auxiliary AV Devices
   - 1.4 Auxiliary Memory
   - 1.5 Local Interfaces
   - 1.6 Telephone Lines
   - 1.7 Special Lines
   - 1.8 Satellites
   - 1.9 Receivers
   - 1.10 Power Generating Equipment
   - 1.11 Carrels
   - 1.12 Other Equipment

2. Facilities
   - 2.1 Classrooms
   - 2.2 Laboratories
   - 2.3 Large Group Instructional Spaces
   - 2.4 Offices
   - 2.5 Individual Learning Spaces
   - 2.6 Libraries and Other Information Resource Centers
   - 2.7 Other Facilities

3. Software
   - 3.1 Systems Programs
   - 3.2 General Applications Programs
   - 3.3 Diagnostic/Test Programs
   - 3.4 Utility Programs
   - 3.5 Other Computer Programs

4. Instructional Systems Development*
   - 4.1 Analyze (Phase I)
   - 4.2 Design Phase (Phase II)
   - 4.3 Development Phase (Phase III)
   - 4.4 Other Instructional Systems Development (ISD) Activities

*If CMI Subsystem is Operational

COST CATEGORIES
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

5. Instructional Methods/Materials*

5.1 Audio
5.2 Audio/Visual
5.3 Film Text/Visual
5.4 Lecture/Demonstration
5.5 Group Discussion/Seminar
5.6 Performance/Practice
5.7 Tutoring (Peer or other)
5.8 Printed Test/Visual
5.9 Other Instructional Methods/Materials
5.10 Tests

*If CMI Subsystem is Operational

6. System Management/Test

6.1 System Integration Engineering
6.2 Program Management
6.3 Operational Test
6.4 Other Direct Management Costs

7. Other Direct Costs (not included in the above)

7.1 Supplies
7.2 Travel
7.3 Consultants
7.4 Contracts/Subcontracts
7.5 Other Direct Costs

8. Preparation

8.1 Training of Initial Site Personnel Cadre
8.2 Site Personnel Pay and Allowances
8.3 Other Preparation Costs

9. Acceptance Test/Management

9.1 Program/Project Management
9.2 Acceptance Test
9.3 Engineering Changes
9.4 Site Checkout/Activation

10. Equipment

- 10.1 Replacement Spares and Repair Test Equipment
- 10.2 Other Equipment

11. System Management

- 11.1 Program/Project Management
- 11.2 Other Direct Management Costs

12. Other Effectiveness Measures

- 12.1 Time Measures
  - Average Training Time in Course
  - Average Testing Time in Course
  - Average Course Time
- 12.2 Achievement Measures (Final Criterion Test Results-First Attempt)
  - Accuracy or Speed Scores
  - Gain Scores
  - Number of Objectives Passed
  - % Students Passed

Attachment 10

INSTRUCTOR TASK LIST
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

INSTRUCTOR TASK LIST
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

This task list describes the activities that an instructor may be performing in courses managed by the AIMS. It can serve as the basis for a checklist to be employed when determining the impact of AIMS upon the job of instructor at USAFAS.

INSTRUCTOR TASK LIST
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

ASSIST STUDENT: Greet student, call roll, inform student of classroom procedure, update student records, answer student's questions.

CONDUCT COURSE SUPPORT: Check serviceability of lesson materials, and equipment. Store, organize and inventory lesson materials, tools, and equipment. Secure classroom, review and update lesson material. Maintain technical orders, maintain classroom expendable supplies.

OVERSEE MEASUREMENT CENTER: Provide examination material, update student record, grade/critique test, assign student, and monitor test center.

CONDUCT STUDENT SUPPORT: Maintain student records, schedule/monitor individual assistance and student breaks. Give safety briefing, enforce safety, insure proper classroom management, lighting and temperature, conduct preassessment briefing and orientation. Monitor student progress.

CONDUCT OTHER SUPPORT: Maintain unclassified file and publication file. Review incoming distribution, inspect facility, receive and assist visiting official, attend meetings.

CONDUCT GRADUATION: Conduct final critique, figure time in course and grade average, and conduct ceremony.

CONDUCT DEMONSTRATION/PERFORMANCE: Conduct demonstration/ performance to give student hands-on training on equipment related to written material.

COUNSEL/CRITIQUE STUDENT: Counsel student on progression and improvement areas. Counsel and assist students with morale, welfare and disciplinary problems. Take necessary corrective action required to maintain discipline.

REVIEW COURSE MATERIAL: Review new and old course and test material.

GRADE TESTS: Review and grade tests, inform student of grade and area needing review.

UPDATE LESSON MATERIAL: Update lesson material to reflect changes in controlling documents.

DEVELOP NEW COURSE MATERIAL: Develop new course and test material.

INSTRUCTOR TASK LIST
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

OPERATE AIMS TERMINALS: Request records and reports, obtain computer prescription, override computer, request student data, locate student, update student record, update resource availability.

REQUEST MAINTENANCE ASSISTANCE: Contact major source for repair. Maintains log of when assistance was called for and when corrective action was taken. Maintains log of down time.

CONSTANT MANNING REQUIREMENT: Monitor classroom.

OTHER:

From: Dallman, et al., 1979.

Attachment 11

INSTRUCTOR ATTITUDE SURVEY AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

INSTRUCTOR ATTITUDE SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

The purpose of this survey is to determine your activities and opinions regarding the various aspects of the AIMS and Computer-Managed Instruction (CMI). Please answer all items in the survey with complete candor. Your individual responses will be held in strictest confidence.

PART I: Background

1. Course:

2. Date:______________________________

3. How long have you been an instructor in this course (months)?______________________________

4. Previous instructor position(s) was in a: (circle appropriate choice(s))

   a. Conventional classroom environment.

   b. Self-paced multimedia instructional environment.

   c. Computer managed self-paced instructional environment.

   d. No previous instructor experience.

   e. Others (specify)______________________________

   ____

   ____

PART II: Attitudes
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

CHECK APPROPRIATE BLOCK TO INDICATE YOUR ATTITUDE TOWARDS THE AIMS. EXPLAIN YOUR SELECTION IN THE COMMENTS SECTION AS NECESSARY.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
1. The majority of the students are meeting the objectives of the course using this method of instruction.						
2. This method is not an effective way to instruct this course.						
3. The examinations adequately evaluate the students on the achievement of training objectives.						
4. The examination procedure is inconvenient and takes too much time.						
5. This method of instruction is a valuable teaching procedure.						

PART II: Attitudes (Cont.)

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

CHECK APPROPRIATE BLOCK TO INDICATE YOUR ATTITUDE TOWARDS THE AIMS. EXPLAIN YOUR SELECTION IN THE COMMENTS SECTION AS NECESSARY.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
6. It takes an experienced instructor to manage this type of instruction.						
7. The students' attitudes toward the course are very favorable.						
8. The students use too much time learning to operate instructional equipment (other than computer terminals).						
9. Students appear to be very interested in the course content.						
10. The students are very enthusiastic about the course.						

PART II: Attitudes (Cont)

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

CHECK APPROPRIATE BLOCK TO INDICATE YOUR ATTITUDE TOWARDS THE AIMS. EXPLAIN YOUR SELECTION IN THE COMMENTS SECTION AS NECESSARY.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
11. The students tend to study less as the instruction progresses.						
12. I have no difficulty answering students' questions.						
13. I have developed a good working relationship with the students.						
14. I use my instructor time more efficiently in this method of instruction.						
15. This course has numerous learning elements that do not lend themselves to computer-managed instruction.						

PART II: Attitudes (Cont)

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

CHECK APPROPRIATE BLOCK TO INDICATE YOUR ATTITUDE TOWARDS THE AIMS. EXPLAIN YOUR SELECTION IN THE COMMENTS SECTION AS NECESSARY.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
16. The AIMS teaches as well as other methods, and in less time.						
17. The instructional procedures in this course need a major revision.						
18. Instructional materials must be more thoroughly organized then for group-paced teaching methods.						
19. The instructional materials concentrate on specific skills and knowledges and excludes "nice to know" lesson material.						
20. The instructional materials and media are suitable for the type of student input into this course.						

PART II: Attitudes (Cont)

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

CHECK APPROPRIATE BLOCK TO INDICATE YOUR ATTITUDE TOWARDS THE AIMS. EXPLAIN YOUR SELECTION IN THE COMMENTS SECTION AS NECESSARY.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
21. Using this method the instructor to student ratio can be reduced over group-paced methods.						
22. Students experienced little difficulty in operating the computer terminal.						
23. Computer-managed instruction will enable a rapid increase in student inputs should need arise.						
24. Looking to the future, I feel that CMI will replace other methods of instruction.						
25. Computer-managed instruction is a potential threat to the jobs of the instructors.						

PART II: Attitudes (Cont)
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

CHECK APPROPRIATE BLOCK TO INDICATE YOUR ATTITUDE TOWARDS THE AIMS. EXPLAIN YOUR SELECTION IN THE COMMENTS SECTION AS NECESSARY.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
26. Any capable instructor can prepare lesson materials for CMI courses.						
27. All instructors should take a CMI course prior to teaching in this mode.						

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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28. Do you feel that the AIMS has done a good job of managing the students off-line activities. Please explain.

29. Has there been an opposition to AIMS among the instructors? If yes, please explain.

30. Do you think that the CMI aspect of the AIMS has accelerated the students' progress through the course?

PART III: Activities (Cont)
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

4

HOW MUCH OF YOUR TIME DURING INSTRUCTIONAL DUTIES FOR THIS COURSE DID YOU SPEND ON EACH OF THE FOLLOWING ACTIVITIES? CHECK THE MOST APPROPRIATE RESPONSE AND EXPLAIN RESPONSE IN COMMENTS AS NECESSARY.	MORE THAN HALF	SUBSTANTIAL AMOUNT	FAIR AMOUNT	VERY LITTLE	NONE	COMMENTS
31. Monitoring students.						
32. Individually counseling students on lesson material.						
33. Counseling students in small groups on lesson material.						
34. Administering tests.						
35. Giving direction on performance exercises.						
36. Maintaining student records.						

PART III: Activities (Cont)

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

HOW MUCH OF YOUR TIME DURING INSTRUCTIONAL DUTIES FOR THIS COURSE DID YOU SPEND ON EACH OF THE FOLLOWING ACTIVITIES? CHECK THE MOST APPROPRIATE RESPONSE AND EXPLAIN RESPONSE IN COMMENTS AS NECESSARY.	MORE THAN HALF	SUBSTANTIAL AMOUNT	FAIR AMOUNT	VERY LITTLE	NONE	COMMENTS
37. Putting malfunctions in equipment for performance exercises.						
38. Checking questions, performance problems, or exams.						
39. Preventive maintenance on equipment.						
40. Repairing faulty equipment.						
41. Reviewing students' records.						
42. Setting up and giving guidance on use of instructional media.						

PART III: Activities (Cont)
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

HOW MUCH OF YOUR TIME DURING INSTRUCTIONAL DUTIES FOR THIS COURSE DID YOU SPEND ON EACH OF THE FOLLOWING ACTIVITIES? CHECK THE MOST APPROPRIATE RESPONSE AND EXPLAIN RESPONSE IN COMMENTS AS NECESSARY.	MORE THAN HALF	SUBSTANTIAL AMOUNT	FAIR AMOUNT	VERY LITTLE	NONE	COMMENTS
43. Counseling students on matters other than lesson material. (Career guidance)						
44. Recording instructor comments about students.						
45. Faculty board actions.						
46. Interaction with other instructors.						
47. Administrative duties not mentioned. (List under comments if they take much of your time.)						
48. Preparing for classroom instruction.						

PART III: Activities (Cont)
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

HOW MUCH OF YOUR TIME DURING INSTRUCTIONAL DUTIES FOR THIS COURSE DID YOU SPEND ON EACH OF THE FOLLOWING ACTIVITIES? CHECK THE MOST APPROPRIATE RESPONSE AND EXPLAIN RESPONSE IN COMMENTS AS NECESSARY.	MORE THAN HALF	SUBSTANTIAL AMOUNT	FAIR AMOUNT	VERY LITTLE	NONE	COMMENTS
49. Self improvement.						
50. Others (List under comments).						

PART III: Activities (Cont)

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

51. Which of the activities do you feel take too much of your instructor time? Indicate by number from the preceding list (Items 31-50).

52. Which of the activities do you feel you need to devote more of your instructor time to? Indicate by number from the preceding list (Items 31-50).

PART IV: Suggestions/Observations

53. Of the classroom environments you are familiar with, which of the following would you prefer to be an instructor in? (Circle best response)

a. Conventional classroom environment.

b. Self-paced classroom environment.

c. Computer managed self-paced classroom environment.

d. Others (specify)________________________________.

54. What training (if any) do you think is needed for instructors using the AIMS instructional method?

PART IV: Suggestions/Observations (Cont)
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

55. What guidelines or advice would you give a new instructor who is going to use this teaching method for the first time?

56. Which of the following items would you identify as advantages of CMI? (Rank in order of importance.)

_____a. Reduced training time.

_____b. Higher student achievement.

_____c. Better student motivation.

_____d. Lower failure rate.

_____e. Preferred by most students.

_____f. Fewer instructors required.

_____g. Greater staff and faculty interest.

_____h. Better performance after training.

_____i. Promotes development of the learning process.

_____j. An effective teacher-aide to the classroom instructor.

_____k. Other (specify)

57. What are the disadvantages of this method of instruction?

PART IV: Suggestions/Observations (Cont)
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

58. What problems have you encountered using this method of instruction?

59. If you were the Director of Training, what would you do to improve the AIMS?

60. What is your frank opinion about the relative worth of computer-managed instruction?

61. How has the implementation of AIMS assisted you in monitoring student progress in the course? Please explain.

62. Do you feel that using the computer to monitor student progress has, in fact, been more effective than the method used previously? Please explain.

63. Can you define or describe any unique or unusual problems encountered in preparing instructional materials not identified when preparing self-paced material?

64. What is your frank opinion of using the computer to randomly generate test items?

65. Has the identification, recording, and hard copy summation of test performance been helpful in pinpointing weak areas of instruction?

AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

66. What problems, if any, have you experienced with student queueing (either waiting to be tested or to start the next task)?

67. Has the AIMS enabled the student to achieve his/her objectives in less time than the prior self-paced course format? Yes________ No________.

68. Do you find that the AIMS student graduation predictions have been more timely and functional than those received under the previous self-paced operation? Please explain.

Attachment 12

STAFF AND FACULTY ATTITUDE SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

STAFF AND FACULTY ATTITUDE SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

DATE____________________

This is a survey to gather information relative to the Automated Instructional Management System (AIMS). Please answer all items in this survey with complete candor. Your responses will be held in strictest confidence. If you feel that you are not in a position to answer a particular item because you have not been closely associated with the AIMS project, circle the item number and leave it blank. Your comments or suggestions will be greatly appreciated.

Please place a check (✓) mark by your position below.

________Instructor

________Education Specialist

________Training Specialist

________Section Chief

________Course Chief

________Division Chief

STAFF AND FACULTY SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
SECTION I. Attitude Toward the AIMS 1. The AIMS is an effective instructional method which can produce high levels of achievement.						
2. The AIMS makes explicit use of the learning process.						
3. Generally, student reaction to the AIMS has been favorable.						
4. The AIMS instructional materials must be better organized than other self-paced instruction.						
5. The AIMS should produce a graduate better equipped to perform at job entry level than does other self-paced instruction.						

STAFF AND FACULTY SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
6. The AIMS teaches as well as other methods, and in less time.						
7. The AIMS concentrates on specific skills and knowledges and excludes "nice to know" items.						
8. AIMS students are more apt to retain skills and knowledges learned for a longer period after completion.						
9. Under the AIMS program, students have varied repetition or practice.						
10. The AIMS instructional strategies are suitable for all types of students found in the courses.						

STAFF AND FACULTY SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
11. The AIMS instructional materials are designed to fit all levels of students.						
12. The AIMS courses do an outstanding job of teaching students to meet performance objectives.						
13. The AIMS enables better students to proceed at an accelerated rate and they invariably complete the course in less than programmed time.						
14. Under the AIMS, course lengths can be adjusted with minimum delay based on student progress.						
15. The AIMS enables the instructor to organize course materials more effectively to meet individual students needs.						

STAFF AND FACULTY SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
16. Slow learners, who would be academic failures in group-paced courses, are able to attain the minimum performance standards under the AIMS.						
17. The AIMS provides more opportunity for students to react to simulated on-the-job performance standards under the AIMS.						
18. The AIMS provides a learning environment that matches the students learning performance with materials appropriate to his learning rate.						
19. The greatest value of the AIMS is that it enables the student to learn at his/her own pace.						
20. The most valid criterion for judging the success of the AIMS is the students' performance after training.						

STAFF AND FACULTY SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
21. Over a period of time, the novelty effect of the AIMS wears off and the students tend to become bored.						
22. It is not anticipated that the implementation of the AIMS will have any impact on the manpower structure of the courses involved.						
23. The administrative requirements (maintaining student records and reports) for the AIMS courses do not differ greatly from other self-paced courses.						
24. On-line pretests/posttests have proved to be highly effective as a teaching/learning strategy.						
25. The AIMS has significantly reduced the instructor to student ratio resulting in a saving of instructor personnel.						

STAFF AND FACULTY SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

PLEASE CHECK THE APPROPRIATE BLOCK TO INDICATE YOUR OPINION OF THE FOLLOWING STATEMENTS. COMMENTS EXPLAINING YOUR SELECTION WILL BE APPRECIATED.	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	COMMENTS
26. To be effective, instructors must be trained in the AIMS techniques in order to properly prepare themselves to meet student needs.						
27. Except for adding another instructor medium, the implementation of the AIMS has caused little or no change in the course operation.						

STAFF AND FACULTY SURVEY
AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (AIMS)

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28. The time required for development of AIMS instructional materials -

a. exceeds that required for group-paced instruction by (indicated percentage) ________%.

b. is about the same as that required for group-paced instruction ________.

c. is less than that required for group-paced instruction by (indicate percentage) ________%.

SECTION II. Open-Ended Questions.

29. In your opinion, what are the advantages and disadvantages of the AIMS instruction when compared to other (group-paced/self-paced) instructional methods?

Advantages	Disadvantages

30. If you were in a position to dictate policy for future self-paced courses in other service schools, what initial guidelines would you give your project officer?

31. What is your frank opinion concerning the relative worth of self-paced versus group-paced instruction?